

Nuclear Energy Research Initiative

Background

In January 1997 the President tasked his Committee of Advisors on Science and Technology (PCAST) to evaluate the current national energy R&D portfolio and provide a strategy to ensure the U.S. has a program to address the nation's energy and environmental needs for the next century.

In its November 1997 report, the PCAST Panel on Energy Research and Development determined that establishing nuclear energy as a viable and expandable option was important and that a properly focused R&D effort to address the potential long-term barriers to expanded use of nuclear power (e.g., nuclear waste, proliferation, safety and economics) was appropriate.

The PCAST panel further recommended that the Department of Energy reinvigorate its nuclear energy research and development activities in an R&D effort to address these potential barriers with a new Nuclear Energy Research Initiative (NERI). This new initiative should fund research based on competitive selection of proposals from the national laboratories, universities and industry.

The Department endorsed the PCAST recommendation and received appropriations for NERI beginning in FY 1999, to sponsor new and innovative scientific and engineering R&D to address the key issues affecting the future of nuclear energy, and to preserve our nation's nuclear science and technology research infrastructure.

To achieve this long range goal, the following objectives have been established:

- Develop advanced reactor and fuel cycle concepts and scientific breakthroughs in nuclear technology to overcome the principal technical and scientific obstacles to the expanded use of nuclear energy including issues involving nuclear proliferation, unfavorable economics, and nuclear waste disposition;
- Advance the state of U.S. nuclear technology to maintain a competitive position in overseas markets and a future domestic market;
- Promote and maintain a nuclear science and engineering infrastructure to meet future technical challenges; and
- Improve performance, efficiency, reliability, and economics to enhance nuclear energy application.

NERI funds innovative scientific and engineering research and development in the following areas:

- Proliferation-resistant reactors or fuel cycles.
- New reactor designs with higher efficiency, lower-cost, and improved safety to compete in the global market; lower output reactors for use where large reactors are not attractive.
- Advanced nuclear fuels.
- New technologies for management of nuclear waste.
- Fundamental nuclear science.



The NERI program features a *competitive, peer-reviewed R&D selection process to fund researcher initiated R&D proposals* from universities, national laboratories and industry.

The NERI research areas are also of critical importance to foreign countries with civilian nuclear programs. NERI encourages foreign participation with U.S. institutions to help maintain the nuclear option worldwide and to leverage scarce research dollars.

Finally, the Department has established an independent Nuclear Energy Research Advisory Committee to provide advice and recommendations to assist the Department on the direction and focus of its energy R&D activities.

FY 1999 Major Activities Accomplishments:

- Completed the initial R&D procurement by soliciting research proposals, conducting proposal peer-review and awarding the first research grant and contracts in May 1999.

- Initiated innovative scientific and engineering research and development projects at universities, national laboratories and industrial organizations that will enhance the performance, efficiency, reliability, proliferation resistance, and economics of nuclear power.

FY 2000 Planned Accomplishments:

- Advance the state of scientific knowledge and technology to enable incorporation of improved proliferation resistance, safety and economics in the design and development of advanced reactor and nuclear fuel systems.
- Improve the understanding of new reactor and fuel cycle concepts and nuclear waste technologies, and develop a preliminary feasibility assessment of the concepts and technologies.



Program Budget (in millions)	
FY 1999 <u>Appropriation</u>	FY 2000 <u>Appropriation</u>
\$19.0	\$22.5